

Message Text

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TAGS: NATO, MARR, ETEL

SUBJECT: NATO IV COMMUNICATIONS SATELLITE

REF: USNATO 5244

1. THERE IS INSUFFICIENT TIME TO FULLY LOAD AND ANALYZE
A NATO IV SPACECRAFT WITH US REQUIREMENTS IN EACH
OF FOUR U.S. ORBITAL LOCATIONS TO ASSESS THE TOTAL
INTEROPERABILITY IMPLICATION AND IMPACT ON U.S.
REQUIREMENTS THAT COULD NOT BE PROVIDED DUE TO ANTENNA
COVERAGE OR POWER AND BANDWIDTH LIMITATIONS. WE HAVE
ASSUMED THE NATO IV TAILORED OPTION TO BE OPTION FOUR
OF THE STC STUDY, BUT WITH AN OPTION FIVE CHANNELIZATION.

2. RESTRICTIONS ON FREQUENCY ASSIGNMENTS FOR BROADBAND

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SIGNALS SUCH AS TDMA AND SSMA REQUIRE THE USE OF THE
SATELLITE EXCLUSIVE BAND IN ITS ENTIRETY (I.E., 50 MH.).
SINCE THE NATO IV DESIGNS SPLIT THE EXCLUSIVE BAND,
THE PLANNED HIGH BURST RATE TDMA OPERATIONS FOR WWMCCS
WOULD BE SERIOUSLY LIMITED OR FORCED TO OPERATE OUTSIDE
THE EXCLUSIVE BAND WHERE WIDE CONTIGUOUS BANDWIDTH
CLEARANCE IS DOUBTFUL. THE 40 MHZ SPREADING OF SIGNALS

ACCOMPLISHED IN THE U.S. SSMA EQUIPMENTS (OM-55 AND AN/USC-28) COULD BE OPERATED AT HALF THIS SPREAD RATE AND OPERATED IN THE 20 MHZ CHANNEL OF NATO IV, BUT WITH A LOSS IN ANTI-JAM CAPABILITY OF APPROXIMATELY 3 TO 4 DB.

3. THE EXTREMELY WIDE CHANNELS OF NATO IV (175 AND 120 MHZ) DO NOT PERMIT SEGREGATION OF USERS AND THEREFORE RESULT IN AN INEFFICIENT USE OF THESE CHANNELS BY SUCH USERS AS WIDEBAND INTELLIGENCE AND THE GROUND MOBILE FORCES AND NAVY SHIPS. THE CHANNEL BANDWIDTH AND SATELLITE GAIN CANNOT BE MATCHED TO THE USERS REQUIREMENTS. FOR EXAMPLE, THE WIDEBAND INTELLIGENCE TRAFFIC IS BETWEEN LARGER FIXED GROUND TERMINALS AND THE GMF TRAFFIC BETWEEN EIGHT FOOT DIAMETER ANTENNAS. CHANNEL GAIN IN THE SATELLITE MUST BE SET FOR THE SMALLER TERMINALS THUS CREATING AN EFFECTIVE REDUCTION IN G/T OF THE LARGE TERMINALS BY SEVERAL DB DUE TO RE-RADIATED NOISE THROUGH THE SPACECRAFT. IN EFFECT A SIXTY FOOT TERMINAL LOOKS LIKE A TWENTY FOOT TERMINAL. THE FREQUENCY PLANS ASSOCIATED WITH THE FOUR-CHANNEL NATO IV SPACECRAFT WILL NOT PERMIT AS EFFICIENT USE OF AVAILABLE CHANNEL BANDWIDTH AND POWER AS WILL THE SIX-CHANNEL DSCS III AND THUS IT IS DOUBTFUL ALL REQUIREMENTS CAN BE ACCOMMODATED IN THE HEAVIER TRAFFIC AREAS SUCH AS

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THE EUROPEAN AREA SERVED BY THE ATLANTIC SATELLITE.

4. NATO IV WOULD NOT PROVIDE SERVICE TO THE SOUTHERN HEMISPHERE, A SERIOUS DEFICIENCY IN THE USE OF SUCH A SPACECRAFT FOR U.S. REQUIREMENTS. THE LACK OF FLEXIBILITY IN PRODUCING NULLS ON JAMMERS LOCATED IN OTHER THAN THE FIXED AREA SERVED BY THE NATO IV ANTENNA DESIGN WOULD GREATLY LESSEN THE SURVIVABILITY OF COMMUNICATIONS FOR THE DSCS AS THE US MUST BE CONCERNED WITH JAMMING THREATS FROM DIFFERENT GEOGRAPHIC AREAS AS WELL AS FROM SIMULTANEOUS MULTIPLE JAMMING SOURCES.

5. US TERMINALS COULD ACCESS A NATO IV TAILORED SPACECRAFT, BUT ONLY WITH THE OPERATIONAL LIMITATIONS AND RESTRICTIONS LISTED ABOVE AND WITH THE FURTHER PROBLEMS OF ACQUIRING AUTHORIZATION FOR A FREQUENCY PLAN QUITE DIFFERENT FROM THE DSCS III PLANS.

6. IN SUMMARY, CONTINGENCY USE COULD BE MADE OF DIFFERENT US AND NATO SATELLITES; HOWEVER, THE REQUIREMENT FOR FULL INTEROPERABILITY INCLUDED IN THE NICSO

REPORT TO THE DPC (DPC/D(78)B) WILL NOT BE POSSIBLE. VANCE

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